Geophysical Research Abstracts, Vol. 8, 07522, 2006
SRef-ID: 1607-7962/gra/EGU06-A-07522

Cluster analysis and pseudo-2D wavelet transform of NCEP/NCAR reanalysis datasets: trends in global temperature fields

P. Pisoft , J. Kalvova

Department of Meteorology and Environment Protection, Faculty of Mathematics and Physics, Charles University, Czech Republic (petr.pisoft@mff.cuni.cz)

This study combines two advanced approaches to analyze and identify geographical regions of similar temperature trends characteristics occurring in NCEP/NCAR reanalysis datasets during the time period of 1951-2000.

First, pseudo-2D wavelet transform was used to analyze all the NCEP/NCAR data grids for 1951-2000. This algorithm purveys 3D information about periodicities hidden in the examined datasets. As a by-product, this analysis, using a wavelet filter, may produce denoised replacements of the original time series. In the end, a grid with smoothed time series is obtained. The second step is to find geographical regions of similar trends characteristics. This has been done using the regular cluster analysis.

In this study, we have used the above algorithms to explore the temperature fields at 500 and 700 hPa geopotential heights. The results illustrate varied trends characteristics across the whole world. They point up geographical regions of different (or similar) distinct behaviour that occurred during different years.